We claim:

1. A method of compressing an image said method comprising the steps of:

segmenting said image;

creating a modeled surface for each segment;

connecting the segments to create an entire modeled image;

generating a texture image; and

combining said texture image and entire modeled image.

2. The method of claim 1 wherein the step of creating a modeled surface for each segment further comprises the step of choosing a canonical polynomial to represent isomorphic singularities in said image.

3. The method of claim 1 further comprising the steps of applying lossy compression to said texture image; and

applying lossless compression to the combined said texture image and said entire modeled image.

4. A method of compressing an image, I_0 said method comprising the steps of:

dividing said image I_0 into segments, each segment having a plurality of pixels;

calculating the dynamic range of the pixels in each segment;

selecting a best match canonical polynomial for each of said segments;

finding substitutes for variables in said canonical polynomial to calculate a modeled surface equation F for each of said segments;

creating a modeled surface I_M for each of said segments by substituting the coordinates of each pixel into the modeled surface equation F;

storing the coefficients for the modeled surface equation F for each of said segments;

finding connections between adjacent ones of said segments;

creating an entire modeled image, I_M, from each of said segments;

finding the difference between the image I_O and the entire modeled image I_M to create a texture image I_d;

applying standard lossy compression to said texture image I_d;

storing the texture image I_d;

combining the entire modeled image I_M and the texture image I_d to create a combination image, and

applying lossless compression to said combination image.

5. A method of compressing a still image said method comprising the steps of:

identifying at least one catastrophe in said image;

representing said catastrophe with a canonical polynomial;

transforming said canonical polynomial into datery.

6. A method of compressing a still image, said method comprising the step of:

representing a region of abrupt changes in pixel intensity in said still image with a canonical polynomial.

7. A method of compressing an image, said method comprising the steps of:

segmenting the image into blocks of pixels;

creating a canonical polynomial surface for at least one catastrophe in at least one of said blocks of pixels;

sending the coefficients of said at least one canonical polynomial as compressed data.

8. A method of compressing an image, said method comprising the steps of:

identifying at least one isomorphic singularity in said image by applying photometric projection to said image;

characterizing said at least one isomorphic singularity with at least one polynomial.

9. The method as defined in claim 8, further comprising the step of:

creating a modeled surface of said image with said at least one polynomial, said modeled surface being isomorphically related to said image.

10. The method of claim 8 further comprising the step of:

transmitting the coefficients of said at least one polynomial as compressed data.

11. A method of compressing an image having manifolds, said method comprising the steps of: modeling the image as a photometric projection of at least one manifold in said image;

mapping said at least one manifold in coordinates (x,y,B) where the coordinate B is luminance at each point (x,y);

characterizing the mapping with a polynomial, said polynomial having coefficients;

sending the coefficients of the polynomial as compressed data.

12. The method of claim 11, wherein the coordinate B does not introduce new singularities.

13. A method of compressing an image, said method comprising the step of describing the shape of object boundaries in the image in polynomial form.

14. A method of compressing an image, said method comprising the steps of:

segmenting the image into segments;

creating a modeled surface for each segment, said modeled surface for each segment being isomorphic with respect to each segment;

connecting adjacent segments to create an entire modeled image, said entire modeled image being isomorphic with respect to said image.

15. The method as defined in claim 14, further comprising the steps of:

calculating the peak signal to noise ratio over the entire modeled image;

calculating the difference between said image and said entire modeled image to retrieve texture information of said image.

16. A method of compressing video, said method comprising the steps of:

determining the error between a current frame and a predicted frame;

inserting an I frame as the next subsequent frame after the current frame if said error exceeds a predetermined threshold.

17. A method of compressing video, said method comprising the steps of:

taking a frame F_0 of the video;

segmenting the frame F_0 into search blocks;

predicting a subsequent frame;

determining the error between the frame F_0 and said predicted frame;

comparing said error to a threshold;

inserting an I frame as the next subsequent frame if said error exceeds said threshold.

18. The invention as defined in claim 17, further comprising the steps of segmenting the frame F_0 into microblocks within said search blocks and normalizing the error by dividing by the number of microblocks.

19. The method as defined in claim 17, wherein said threshold is based upon video content.

20. The method as defined in claim 17, wherein said I frame is inserted in place of said frame F_0 if said error exceeds said threshold.

21. The method as defined in claim 17, further comprising the step of dynamically changing the compression ratio on a frame by frame basis based upon said error.

22. The invention as defined in claim 21, wherein one of a genetic algorithm, neural network, and fuzzy logic are used to determine the necessary change in compression ratio.

23. A method of compressed video transmission, the method the steps of:

taking a first frame F_0;

segmenting said frame F_0 into blocks;

compressing each said block by representing it with a canonical polynomial having original coefficients;

predicting a frame P subsequent to said frame F_0;

determining the error between each block in said frame F_0 and said predicted frame P;

accumulating the error determined between each block in said frame F_0 and said predicted frame P;

comparing said accumulated error to a threshold;

if said accumulated error exceeds said threshold, inserting an I frame as the next subsequent frame to said frame F_0.

24. A method as defined in claim 23 wherein said I frame was previously compressed by representing it with canonical polynomials.

25. A method of compressed video transmission, the method comprising the steps of:

taking a first frame F_0;

segmenting said frame F_0 into blocks;

compressing each said block by representing it with a canonical polynomial having original coefficients;

predicting a frame P subsequent to said frame F_0;

comparing each block in said frame F_0 with said predicted frame P to determine if there is a match;

if a match is found in said frame P for a block in said frame F_0, sending said coefficients of said polynomial for that block to a decoder;

if a match is not found for a block in said frame F_0, generating new coefficients of said polynomial representing said predicted frame P and sending said new coefficients to said decoder;

reconstructing said frame F_0 in said decoder from said original coefficients and said new coefficients sent to said decoder;

calculating an error between said frame F_0 and said predicted frame P based on said comparing each block in said frame F_O with said predicted frame P;

comparing said error to a threshold;

if said error does not exceed said threshold, sending a B or P frame as the next subsequent frame to said frame F_O;

if said error exceeds said threshold, inserting an I frame as the next subsequent frame to said frame F_O.

26. The method as defined in claim 25, further comprising the steps of replacing said original coefficients, and said new coefficients with an I frame.

27. A method of compressing a video image, said method comprising the steps of:

taking a frame F_O;

segmenting F_0 into blocks and defining motion vectors for said blocks to predict a subsequent frame P having corresponding blocks;

defining errors between said blocks in said frame F_0 and said corresponding blocks in said frame P;

accumulating said errors; and

based on said accumulated error, sending an I frame as the next subsequent frame to said frame F_0.

28. A method of automatically recognizing a target in an image, said method comprising the steps of:

segmenting said image into segments;

creating a modeled surface for each segment;

connecting the segments to create an entire modeled image; and

comparing said entire modeled image to a library of known images to determine if there is a match with a known image in said library of images.

29. The method of claim 28 wherein the step of connecting said segments to create said entire modeled image produces a target image having the sculpture characteristics of the image.

30. A method of automatic target recognition, said method comprising the steps of:

taking an image having texture and sculpture characteristics;

processing the image so as to separate said texture characteristics from said sculpture characteristics;

comparing said sculpture characteristics to a library of known images.

31. A method of analyzing an image for automatic target recognition, said method comprising the steps of:

separating the image into texture components and sculpture components;

applying soft ATR to said sculpture components to create a soft ATR sculpture component;

combining said texture components and said soft ATR sculpture components to form a combined image;

applying hard ATR to said combined image.